

cember 29, 1889, with a 30-day departure of 21.1°; on the same day at Galveston and Indianapolis; on December 22 at Alpena, and on January 1, 1890, at Philadelphia.

As a rule, these courses of temperature pass off as deliberately as they come. The normal at Philadelphia was reached on March 17, 1890, and was crost at Alpena February 21; at Indianapolis and Memphis, February 20, and at Galveston, February 28.

These notes are suggestive of what might be found if a similar showing could be made for many stations. These large temperature movements do not fit to seasons as might be inferred from the cases cited. In the five years 1901-5 at Philadelphia there were sixteen courses of temperature having 30-day departures of 3° or more. The extremes were reached in eight different months.

It is evident that until the tides of the ocean had been observed by tide gages and the general movement measured no connection with the moon could have been traced. My belief is that we can not hope to discover the cause for our abnormal seasons until the departures from average seasons are measured.

SEASONAL DEPARTURES OF TEMPERATURE AT PHILADELPHIA, PA., DURING THE LAST TWENTY YEARS.

By HENRY GAWTHROP Dated Swarthmore, Pa., February 6, 1908.

On April 22 and October 22 the average of the day's mean temperature is the same as the average mean temperature for the year, and (at Philadelphia) these dates of equi-temperatures are midway between the coldest and warmest days of the year.

From the Philadelphia daily newspapers of January 1, April 23, and October 23, I have taken the accumulated departures of temperature; these data are all that is necessary to find the departures for the half-years shown in Table 1.

TABLE 1.—Accumulated seasonal departures of temperature at Philadelphia, Pa.

Years.	Summer half-year. (April 23-October 22.)		Years.	Winter half-year. (October 23-April 22.)	
	Excess. (+)	Deficiency. (-)		Excess. (+)	Deficiency. (-)
1887	159	0	1887-1888	0	127
1888	353	0	1888-1889	396	0
1889	26	0	1889-1890	951	0
1890	93	0	1890-1891	234	0
1891	27	0	1891-1892	17	0
1892	109	0	1892-1893	442	0
1893	11	0	1893-1894	292	0
1894	177	0	1894-1895	338	0
1895	139	0	1895-1896	125	0
1896	112	0	1896-1897	287	0
1897	123	0	1897-1898	572	0
1898	367	0	1898-1899	53	0
1899	131	0	1899-1900	253	0
1900	632	0	1900-1901	220	0
1901	286	0	1901-1902	63	0
1902	50	0	1902-1903	648	0
1903	10	0	1903-1904	578	0
1904	49	0	1904-1905	363	0
1905	213	0	1905-1906	404	0
1906	314	0	1906-1907	3	0
Sum	2,991	390	Sum	4,453	1,918

I note that there have been thirty periods of excess and ten of deficiency. The former foot up 7444° and the latter 2308°. The latest table of normals is, I believe, for about thirty-five years, so that these figures indicate that the first sixteen years must have had cold times to balance these warm years.

It is just possible that these dates of equi-temperatures might, by use, become as well established in the popular mind as the equinoctial was in the past generation. From October 23 to April 22, moreover, is approximately the period of furnace fires, and the accumulation of departures would appeal to the housekeeper.

It is also of interest to divide into three-month periods, for example:

October 23 to January 22.		January 23 to April 22.	
1904-5	-210°	1905	-153°
1905-6	+275°	1906	+129°
1906-7	+264°	1907	-261°
1907-8	+268°		

These periods of half and quarter temperature years are interesting for comparison, but are not the measure of the course of temperature desired. With the more exact measurement and the comparisons between many stations the evident great movements of temperature could be ascertained both as to area covered and their coming and going.

ELECTRIC DISTURBANCES AND PERILS ON MOUNTAIN TOPS.

By PROF. J. E. CHURCH, jr., Reno, Nev.

[Communicated January 11, 1908, by PROF. ALEXANDER G. McADIE.]

In view of the scientific interest that has been aroused by the sudden death of mountaineers on the widely separated peaks of San Gorgonio and Whitney, during apparently the same electrical storm, in July, 1904,¹ the following recent experience of Capt. R. M. Brambila, U. S. Infantry, and the writer, will be welcomed as furnishing some hint of the power and magnitude of such electric disturbances. This experience was endured by the party during the regular visit to the automatic weather observatory maintained by the Nevada Agricultural Experiment Station on Mount Rose (altitude 10,800 feet), the dominating peak north of Lake Tahoe, on the California-Nevada State line, approximately 200 miles north of Mount Whitney.

The storm, which was mainly electric in nature, displayed itself first on the evening of Friday, October 19, 1907, in a heavy cloud mass lying close along the Carson Range, north of Mount Rose, but in no wise involving it. The flashes of lightning were frequent and heavy. Little thunder, however, if any, was heard. On the morning of the 20th, when the actual ascent of Mount Rose began, clouds gathered from the direction of Lake Tahoe about the summit, and enveloped it somewhat persistently during the day. The wind did not exceed 10 miles per hour, and the temperature remained above freezing.

From the summit itself the canyons below could be seen filled with masses of vapor. As night darkened a moderate storm of hail and snow with rain began to fall. The pack horse, which had been stabled on a terrace just below the observatory, was covered from tail to ears to protect him from the pelting missiles.

Then the electric display began, first as dull detonations to the south, and after an interval a flash at the observatory window, as if there were wires in the observatory and electricity had struck them. To this we paid little heed, for the occur-

¹ The distance between these peaks, which lie on opposite sides of the Mojave Desert, southern California, is approximately 180 miles, and the difference in elevation is 5,000 feet, the higher peak, Mount Whitney (altitude 14,499 feet [Gannett's Dictionary of Altitudes, fourth edition, gives 14,502]), being the highest mountain in the United States, excluding Alaska.

The death on San Gorgonio, said to be the first case of the kind in San Bernardino County, occurred July 24, 1904; that on Mount Whitney two days later, July 26. Referring to these fatalities Prof. Alexander G. McAdie, quoted in the Monthly Weather Review, September, 1904, page 420, says:

"The accidents have a scientific interest in that there are but few records of deaths by lightning in this State. But it should be noted that comparatively few people have been exposed to storms at high elevations. Mr. Byrd Surby was killed on the summit of Mount Whitney, within 50 feet of the monument. It was snowing at the time of the accident. It is probably not well known that the variations in the electrical potential of the air during a snowstorm are almost as rapid and as great as those prevailing during a thunderstorm. In this present case I am inclined to think that the electrical disturbance was not localized, but simply incidental to a disturbed field which extended well over the high Sierra, Inyo, Panamaint, and Telescope ranges; also the San Bernardino Range, and probably the mountains of Arizona. This condition lasted perhaps a fortnight."